**Nuclear Data Section**

**International Atomic Energy Agency**

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**Memo 4C-3/0424**

**Date:** 17 February 2024

**To:** Distribution

**From:** N. Otsuka

**Subject: Np-237 absolute fission cross sections from TUD-KRI collaboration**

It has been known that the fission cross sections measured with the associated particle method under the collaboration between Technical University Dresden (TUD) and Radium Institute (KRI) have been revised and often compiled several times. I reviewed the situation for the 237Np(n,f) case, and adopted the following numbers as the final values for my evaluation:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| En (MeV) | 1.9 | 4.9 | 8.5 | 14.7 | 18.8 |
| TUD (b) | -  | 1.542±0.031 | 2.265±0.066 | 2.285±0.044 | 2.310±0.052 |
| KRI (b) | 1.73±0.05 | - | - | 2.214±0.040 | - |

The following corrections in EXFOR entries are proposed:

**30475.004:**

* Supersede 2.226±0.024 b at 14.7 MeV by 2.285±0.044 b at 14.7 MeV in 22304.008.

**30558.003**:

* Supersede 2.163±0.043 b at 8.5 MeV by 2.265±0.066 b at 8.4 MeV in 22304.004.

**40911.006**:

* Delete 2.163±0.045 b at 8.4 MeV. (Data from 3DDRROS. Compiled in 30558.003.)
* Delete 2.210±0.024 b at 14.7 MeV. (Experimental location unclear).
* Compile 2.214±0.040 b at 14.7 MeV in V.N.Dushin+,J,SJA,55,656,1984 (data from 4RUSRI) somewhere.

**40552.003**:

* Supersede 2.430±0.047 b (data from 4RUSRI) by 2.214±0.040 b (see above).

The detailed history of each published value is summarized in the appended list.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |   |   | **Laboratory** | **KRI** | **KRI** | **KRI?** | **ZfK** | **ZfK** | **TUD** | **ZfK** | **Remark** |
|  |   |   | **En (MeV)** | **1.9** | **14.7** | **14.7** | **4.9** | **8.5** | **14.7** | **18.8** |   |
|  |   |   | **n.source** | **D-D** | **D-T** | **D-T** | **D-D** | **D-D** | **D-T** | **D-T** |   |
| **EXFOR #** |  | **Data source** |  |  |  |  |  |  |  |  |  |
| 22304.004 |   | C,91JUELIC,,510,1991 |   |  |  |  | 1.542(31) | 2.265(66) |   | 2.310(52) |   |
| 22304.008 |   | C,91JUELIC,,510,1991 |   |  |  |  |  |  | 2.285(44) |  |   |
| 40927.004 |   | J,YK,,(4),3,1987 |   | 1.73(5) |  |  |  |  |  |  |   |
| 30558.003 |   | J,AE,55,218,1983 |   |  |  |  |  | 2.163(43) |  |  | Must be superseded |
| 40911.006 |   | C,83MOSKVA,2,201,1983 |   |  |  | 2.210(24) |  | 2.163(45) |  |  | 2.163(45) must be deleted.2.210(24) must be probably deleted. |
| 30475.004 |   | S,ZFK-410,122,1980 |   |  |  |  |  |  | 2.226(24) |  | Must be superseded |
| 40552.003 |   | C,77KIEV,3,155,1977 |   |  | 2.430(47) |  |  |   |  |  | Must be superseded by 2.214(40) or 2.210(24) |
| **CINDA date** | **Author** | **Reference** | **Alias, translation** |  |  |  |  |  |  |  |  |
| 199200 | Hausch | T,HAUSCH,1992 |   |  |  |  |  |  | 2.263(44) |  | Revised from 2.182(24) in T,WAGNER,1982 |
| 199200 | Hausch | T,HAUSCH,1992 |   |  |  |  |  |  | 2.308(45) |  | Revised from 2.226(24) in T,WAGNER,1982 |
| 199200 | Hausch | T,HAUSCH,1992 |   |  |  |  |  | 2.265(66) |  |  | Revised form 2.151(45) in T,JOSCH,1983 |
| 199200 | Hausch | T,HAUSCH,1992 |   |  |  |  | 1.542(31) |  |  | 2.310(52) |   |
| 199105 | Merla+ | C,91JUELIC,,510,1991 |   |  |  |  | 1.542(31) | 2.265(66) | 2.285(44) | 2.310(52) | 14.7 MeV data mean of two vaues by Hausch? |
| 198711 | Kalinin+ | J,YK,,(4),3,1987 | R,INDC(CCP)-365,23,1994 | 1.73(5) |  |  |  |  |  |  |   |
| 198612 | Shpakov | J,YK,,(4),19,1986 | R,INDC(CCP)-302,33,1989 | 1.73(5) |  |  |  |  |  |  |   |
| 198510 | Kovalenko+ | J,IP,21,344,1985 |   |  |  |  |  | 2.151(45) | 2.226(24) |  |   |
| 198312 | Alkhazov+ | C,83MOSKVA,2,201,1983 |   |  |  | 2.210(24) |  | 2.163(45) |  |  |   |
| 198310 | Dushin+ | J,AE,55,218,1983 | J,SJA,55,656,1984 |  | 2.214(40) |  |  | 2.163(45) | 2.226(23) |  |   |
| 198300 | Josch | T,JOSCH,1983 |   |  |  |  |  | 2.151(45) |  |  | Revised to 2.265(66) in T,HAUSCH,1992 |
| 198212 | Arlt+ | S,ZFK-491,135,1982 | S,INDC(GDR)-26,135,1982 |  |  |  |  | 2.151(45) | 2.226(24) |  |   |
| 198210 | Arlt+ | P,ZFK-488,20,1982 | P,INDC(GDR)-25,20,1982 |  |  |  |  | 2.151(45) |  |  |   |
| 198207 | Arlt+ | S,ZFK-476,63,1982 | S,INDC(GDR)-21,63,1982 |  |  |  |  | 2.151(45) |  |  |   |
| 198200 | Wagner | T,WAGNER,1982 |   |  |  |  |  |  | 2.182(24) |  | Revised to 2.263(44) in T,HAUSCH,1992 |
| 198200 | Wagner | T,WAGNER,1982 |   |  |  |  |  |  | 2.226(24) |  | Revised to 2.308(45) in T,HAUSCH,1992 |
| 198102 | Arlt+ | J,KE,24,48,1981 |   |  | 2.292(44) |  |  |  | 2.226(24) |  |  |
| 198006 | Arlt+ | P,INDC(GDR)-12,9,1980 |   |  | 2.292(44) |   |   |   | 2.226(24) |  | 2.92(44) printed in the report is probably wrong. |
| 198005 | Arlt+ | P,ZFK-408,26,1980 | P,INDC(GDR)-14,26,1980 |  | 2.292(44) |   |   |   | 2.226(24) |  |   |
| 198001 | Arlt+ | S,ZFK-410,122,1980 | S,INDC(GDR)-13,122,1980 |  | 2.292(44) |   |   |   | 2.226(24) |  |   |
| 197910 | Arlt+ | C,79KNOX,,990,1979 |   |  | 2.292(44) |   |   |   | 2.226(24) |  |   |
| 197910 | Adamov+ | C,79KNOX,,995,1979 |   |  | 2.292(44) |  |  |  |  |  |   |
| 197906 | Arlt+ | P,ZFK-385,18,1979 |   |  |  |  |  |  | 2.172(23) |  | quoted as preliminary value |
| 197901 | Arlt+ | S,ZFK-382,180,1979 | S,INDC(GDR)-9,180,1979 |  |  |  |  |  | 2.172(23) |  | preliminary value |
| 197704 | Alkhazov+ | C,77KIEV,3,155,1977 | R,INDC(CCP)-118,(3),155,1977 |  | 2.430(47) |  |  |  |  |  |   |
| 197704 | Adamov+ | C,77NBS,,313,1977 |   |  | 2.430(47) |  |  |  |  |  |   |